CLAIMS

I claim:

1. An apparatus for measuring signals over a large range, comprising measurement circuitry to measure signals, the measurement circuitry having a number of respective ranges, and

a range selector, including

a non-linear amplifier to select the range of the measurement circuitry based on the magnitude of the signal to be measured.

2. The apparatus of claim 1, wherein the non-linear amplifier is a logarithmic amplifier.

3. The apparatus of claim 1, wherein the range selector includes a number of comparators responsive to the non-linear amplifier to select range of the measurement circuitry.

4. The apparatus of claim 1, wherein the measurement circuitry is linear-ranging measurement circuitry.

5. The apparatus of claim 1, wherein said non-linear amplifier compresses the dynamic range of the measured signal for determining the range of the measurement circuitry.

6. The apparatus of claim 1, further comprising a light detector responsive to an optical input signal variable over a wide signal strength range.

7. The apparatus of claim 6, further comprising a pre-amplifier for amplifying signals from the light detector.

8. The apparatus of claim 6, wherein the measurement circuitry and the range selector are connected in parallel to receive substantially simultaneously as an input a signal a signal proportionally representative of light incident on the light detector.

9. An optical power meter comprising the apparatus of claim 8.

10. An optical measuring instrument comprising a plurality of the optical power meters of claim 9 for measuring substantially simultaneously respective optical inputs.

11. An optical power meter, comprising

measurement circuitry for measuring electrical signals representative of detected light over a wide range of optical power, including

ranging circuitry to determine respective ranges of the optical power measured, and

a non-linear selector in parallel with the measurement circuitry to control operation of the ranging circuitry to select the measuring range of the measurement circuitry in response to magnitude of the signal to be measured.

12. A range selector for measurement circuitry useful to measure inputs having a wide range of variation over a number of orders of magnitude, comprising

a non-linear amplifier providing an output in response to an input representative of a signal to be measured, and

range selection circuits responsive to the non-linear amplifier to provide range selection signals for use to select operating range of such measurement circuitry.

13. The range selector of claim 12, wherein a plurality of the ranges are linear.

14. The range selector of claim 13, wherein are respective decades.

15. A high speed range selector for optical power measuring apparatus including measurement circuitry having ranging circuitry and operable to measure signals over a number of substantially linear ranges, characterized in that

a non-linear means responsive to the magnitude of the signal to be measured provides an input to determine the range selected by the ranging circuitry.

16. An optical component spectrum analyzer, comprising

a measuring system for measuring incident light,

the measuring system having a number of substantially linear operative ranges representative of optical power of the incident light over which such incident light is measurable,

a logarithmic amplifier responsive to a representation of the optical power of the incident light for providing a non-linear output representative of such optical power, and

comparator circuitry responsive to such non-linear output for selecting the operative range of the measuring system.

17. A method of selecting the measuring range of measurement circuitry used to measure an input, comprising

using a non-linear representation of the input to select the measuring range of the measurement circuitry.

18. The method of claim 17, said using comprising using a logarithmic amplifier to sense the magnitude of signals to be measured and based on that sensing selecting a linear measuring range of the measurement circuitry.

19. A method of measuring a signal having a large dynamic range using measurement circuitry having plural ranges, comprising

compressing the dynamic range of the measured signal for measurement by the measurement circuitry operative in a respective range.

20. The method of claim 19, wherein the measurement circuitry comprises linear-ranging measurement circuitry and further comprising using the compressed measured signal to select the range of the measurement circuitry.

21. The method of claim 20, said compressing comprising using a logarithmic amplifier to amplify an input signal that varies over a wide range to provide a compressed signal for selecting the range of the measurement circuitry.